

Putative anti-inflammatory, antioxidant, and anti-apoptotic roles of the natural tissue guardian methyl palmitate against isoproterenol-induced myocardial injury in rats

Yousra Mohamed Sabry, Ahmed B. Hamed, Eman M. Mantawy, Wesam M. El-Bakly, Samar S. Azab

Abstract

Myocardial injury is considered as a worldwide main cause of morbidity and mortality. The present study aimed to investigate the probable cardioprotective activity of the naturally occurring endogenous fatty acid ester methyl palmitate (MP) against isoproterenol (ISO)-induced myocardial injury in rats and the possible underlying molecular mechanisms. The study was carried out in two consecutive sets of experiments; the first set screened the cardioprotective dose of MP in ISO-intoxicated rats. In the second set, forty male Sprague Dawley rats received either MP (150 mg/kg) or vehicle (150 mg/kg) for 2 consecutive doses of ISO separated by 24 h on 13th and 14th days. Different cardiotoxicity and oxidative stress markers were assessed. Furthermore, endothelial nitric oxide synthase (eNOS) levels were determined. For detection of apoptosis, Bax, Bcl-2, and caspase 3 were estimated. To assess inflammation, toll-like receptor 4 (TLR-4) and tumor necrosis factor-alpha (TNF- α) were measured using ELISA. Meanwhile, nuclear factor kappa B (NF- κ B) and cyclooxygenase-2 (COX-2) were detected immunohistochemically.

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